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Financial Assistance Programs for Pollution Prevention and Control Available Through the Federal Government

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Financial Assistance Programs for Industrial Pollution Prevention and Control Available Through Federal Government Agencies

It is clear from provisions of the various environmental protection laws enacted during the past several years that environmental expenditures by businesses can be significant. It is for this reason that EPA has endeavored to publish a summary brochure outlining the various federal financing programs to help alleviate such impact, particularly on the smaller businesses. It is also the intent of the brochure to call attention to the various tax provisions in the Internal Revenue Code related to pollution control expenditures.

Several Federal governmental programs to reduce or soften the effect of these pollution control expenditures have been provided by excluding pollution control devices from certain sales, use and property taxes allowing companies to use tax-exempt financing for the expenditures, or by granting special depreciation allowances. Such programs permit a company to pay lower taxes or financing costs than it normally would if the equipment being purchased were for a manufacturing or other business purpose. In addition, through Federal construction grants to municipalities, the cost of treating a company's wastewater can often be reduced if a municipality treats the wastewater.

A considerable body of new tax and financing regulations exist for such equipment and financial managers of these businesses should become familiar with them. Obtaining optimum financial and tax benefits could afford a company considerable savings over the life of the equipment.

This pamphlet merely discusses the law in general terms and counsel should be consulted with respect to the interpretation of any of the provisions described. Furthermore, these programs may be revised at any time.

For reprints of this brochure write to the Environmental Protection Agency, Office of Analysis and Evaluation, Room 831 East Tower, WH-586, 401 M Street, S.W., Washington, D.C. 20460 or telephone (202) 755-7640.

I. Small Business Administration Loans

The Small Business Administration (SBA) is charged in the Small Business Act with aiding small businesses in their financing needs. Section 8 of the Federal Water Pollution Control Act of 1972 amended Section 7 of the Small Business Act by authorizing loans to assist small business concerns to add to or alter their equipment, facilities, or methods of operation in order to meet the requirements of the Federal Water Pollution Control Act. The loans are to provide assistance to eligible small businesses, farmers and feedlot operators who might otherwise incur a substantial economic injury. The Environmental Protection Agency (EPA) must certify that the equipment for which the loan is requested will be sufficient to bring the firm in compliance with the applicable environmental regulations.

A small business concern may be eligible for an SBA loan if its requirement for a loan is a result of engaging in one of the following activities and/or any one of the following conditions exists.

1. The business has an effluent discharge requiring a National Pollution Discharge Elimination System permit under Section 402 of the Federal Water Pollution Control Act.

2. The business emits discharges through a sewer line into a publicly owned treatment works and the city or town requires the pretreatment of waste discharge.

3. The business plans to discharge into a municipal sewer system through the construction of a lateral or interceptor sewer.

4. The business is subject to the requirements of a State or regional authority for controlling the disposal of pollutants that may affect groundwater.

5. The business is subject to a U.S. Army Corps of Engineers permit for disposal of dredged or fill material.

6. The business is subject to Coast Guard or State government requirements regarding the standard of performance of marine sanitation devices controlling sewage from vessels.

7. The business is implementing a plan to control or prevent the discharge or spill of oil or other hazardous substances.

The SBA also makes loans for air pollution control under the authority of the economic injury loan provisions of the Small Business Act. Although the legislation does not specifically

provide for such loans, the SBA has administratively determined that firms which must comply with regulations under the Clean Air Act are eligible for SBA loans.

Direct loans to eligible firms are provided when commerical loan sources are unavailable or can provide only part of the required financing. Loans are currently being made at 6.625 percent for up to 30 years. Farmers are also eligible for these loans even if they are organized as a partnership or corporate business organization.

Inquiries may be directed to any SBA or EPA office or by writing to Sheldon Sacks, at Environmental Protection Agency, Office of Analysis and Evaluation, WH-586, 401 M Street S.W., Washington, D.C., 20460.

II. Industrial Development Bonds

The Congress has authorized the sale by state and local governments of IDB's to help companies obtain financing necessary to meet Federal pollution control requirements.

These pollution control bonds usually are sold through a state or municipal agency to underwriters who resell them to investors. Funds raised must be spent for meeting air and water pollution requirements.

This type of financing has been extensively utilized by large businesses for their financing of pollution control facilities. Essentially a public entity issues tax exempt revenue bonds on which repayment is based solely on the credit of the business. The payments on and redemption of the bonds are made by a trustee for the public entity from payments received from the business in fullfillment of the contract between the business and the public entity. The public entity is the nominal owner of the property; the property is conveyed to the business under a lease, lease-purchase, installment sales or similar contract. The business may obtain additional tax advantages such as the investment credit and accelerated amortization.

Internal Revenue Service Regulation at 26 CFR 1.103-8 (g)(2)(i)(b), sets forth the conditions under which interest on governmental obligation bonds for financing industrial air and water pollution control facilities are tax free. Essentially all types of permanent facilities such as piping, pumping, treatment units, etc. are eligible. Direct dischargers as well as dischargers into municipal systems may likewise be eligible.

III. SBA Guaranteed Pollution Control Revenue Bonds

Public Law 94-305, effective June 4, 1976 amended Part A of the Small Business Investment Act. The Act authorizes SBA to guarantee the payments on bonds for existing small businesses or groups of businesses who are at a financial or operational disadvantage, for the purpose of financing pollution control equipment required by law. The statute specifically provides that the financing of the pollution control facilities may be provided through industrial revenue bonds, issued by a State or political subdivision, on which the interest is exempt from federal income tax under the Internal Revenue Code and Treasury regulations.

The program is aimed at viable and sound enterprises that do not have ready access to the long term capital markets. Its principal feature is a Federal guarantee of a lease of the pollution control facilities between the State, or political subdivision and the small business concern. The guaranteed rentals will be used for the issuance of its revenue bonds.

Small businesses have usually been unable to utilize the Industrial Development Bond (IDB) method of financiang because they have generally a limited credit history and because of its financing requirements. Also, the selling costs of a small issue negate the lower interest costs available under this method of financing. PL 94-305 makes available SBA's guarantee on the payments made by a small business to a public entity so that the small business can take advantage of IDB financing.

The primary purpose of using tax exempt industrial revenue bond financing for pollution control facilities is to obtain the most advantageous interest rates and repayment terms possible. Tax exempt bonds may be issued with a sinking fund provision for redemption at particular dates or may be in serial form with varying maturities up to 25 or 30 years. The interest rate may be the same for the full issue or it may vary according to maturity and market conditions. The interest rate for a bond issue with SBA's guarantee of the underlying payments would be comparable to AAA municipal bond rates.

Since the most favorable interest rates are generally available only on large bond issues ($5 million and up), the pollution control financing needs for several small businesses would probably be combined into a single bond issue. SBA would then guarantee the payments of each small business on the underlying contract which would be assigned (by a public entity the issuer) to a trustee. The payment of the bond issue would be tailored to meet

the needs of the small businesses involved and the prevailing conditions in the tax exempt market.

While industrial revenue bond financing normally provides for the most favorable repayment terms and the lowest cost to the borrower there are instances where the financing needs of a small business concern are too small to make IDB financing practical. Where the small business so certifies or when the project may not qualify, financing may be available under Section 7 (a) (5) or 7 (g) of the Small Business Act, or through a guarantee made under a straight loan by the SBA.

Inquiries should be directed to any SBA office or SBA, Office of Community Development, 1441 L Street. N.W., Washington, D.C. 20416.

IV. EPA Construction Grants for Municipalities

The U.S. Congress passed the Federal Water Pollution Control Act in 1956. A major element of the Act authorizes the Federal government to award grants to municipalities to help finance construction of sewage treatment facilities. The program was significantly expanded by the 1972 Amendments to the Act.

Under the construction grant program, the Environmental Protection Agency (EPA) is authorized to make grants for the construction of new municipal sewage treatment facilities. The federal funding share for these projects is 75 percent. The rest of the initial costs are divided among state and local governments and industrial users who hook up to the municipal sewage system.

The law requires that industrial users of publicly owned works financed through Federal grants, pay their proportionate share of total construction, operation, maintenance and replacement costs. Accordingly, when industrial users hook up to these facilities, they must (1) pay a user charge based on the operation and maintenance costs incurred by the municipal facility in treating their discharges, and (2) repay the portion of the Federal grant which is allocable to the treatment of their industrial wastes. A portion of these repayments are retained by the municipalities to help offset their costs for the treatment facility and to provide funds for future expansions.

The user charge system must generate sufficient annual revenue to offset all operational and maintenance costs and must be reviewed periodically and revised as necessary. A surcharge may be levied when pollutant concentrations from a single source exceed normal rates for domestic sewage. There can be no discount rates for large volume users.

Although the industrial cost recovery requirement ensures that industrial users will repay the Federal share allocated to their industrial wastes, capital cost recovery may occur over a period of thirty years and there need be no interest charges. The municipal grants program may therefore provide a significant benefit to industrial users.

Inquiries should be sent to the Construction Grants Program, EPA, 401 M St. S.W., Washington, D.C., 20460.

Public Law 94-558 signed into law October 19, 1976 amends Title II of the FWPCA by adding a new section 213, Loan Guarantees for Construction of Treatment.

The EPA Administrator is authorized to guarantee loans made by the Federal Financing Bank to EPA grantees to finance the local share for grants for construction of treatment works. The guarantee may not be made unless the Administrator certifies that the grantee cannot obtain sufficient credit on reasonable terms as determined by the Secetary of the Treasury to finance its actual needs without the guarantee and unless the Administrator determines that there is reasonable assurance of repayment.

Inquiries should be sent to the Director, Grants Administration Division (PM-216), Attention Municipal Loan Guarantee Program EPA, 401 M St. S.W. Washington, D.C., 20460.

V Industrial Participation of EPA Grants

Under Section 105 of the FWPCA industry may participate in various grant programs for the construction of permanent wastewater treatment facilities on industry property to develop and demonstrate new or improved methods of treating industrial wastewaters or otherwise preventing pollution, which method shall have industry wide application. Grants so authorized may not exceed 75 percent of the projected costs. The Federal Water Pollution Control Act, as amended also provides grants for projects which can develop and demonstrate "new or improved methods of joint treatment systems for municipal and industrial wastewaters." The grants program is a cost-sharing type of agreement. However, in some of EPA's research and development, the Federal Government bears the full cost, contracting with appropriate non-government entities for these services. Through the contract or grant device, EPA can support almost any related worthwhile project under almost any type of institutional arrangement.

To receive a grant two basic conditions must be met: First, the project must have scientific and technical merit. There must be technical competence associated with the project. Second, the project activities must usefully demonstrate a way to combat water pollution. The results must be accurate in terms of both cost and performance. The results must be made available to the public.

Section 103 and 104 of the Clean Air Act also authorizes EPA to make research and development grants and contracts to public and private institutions and others, including industries, for innovative methods to prevent air pollution by industries.

Inquiries should be addressed to Stephen Gage, DAA Office of Research & Development, Principal Engineering Science Advisor, EPA, 401 M St., Washington, D.C., 20460.

VI. Economic Development Administration Loans

The Economic Development Administration (EDA) of the U.S. Department of Commerce is charged with the responsibility of stimulating the industrial growth and economic development of economically depressed areas of the country. EDA business development loans are made to firms in an attempt to upgrade an area economically primarily through the creation of new and permanent jobs and higher incomes for local residents.

While pollution control considerations are not specifically related to the EDA's objectives of alleviating economic distress and increasing employment, the business development loan program can indirectly help firms to install pollution control equipment. For example, if a firm does not meet Federal environmental regulations, is located in a low growth area as designated by the EDA, and there is the likelihood the firm would be shut down and jobs lost for noncompliance of environmental regulations the firm may be eligible for an EDA business development loan.

Maturity is ordinarily based on the useful life of the fixed assets being acquired and a loan may extend to 25 years. Interest rates are determined by the cost of U.S. Government borrowing and are currently 7 7/8% on EDA fixed asset business loans. Rates are adjusted quarterly.

EDA also has the authority to make direct loans and to guarantee loans up to 90%.

Inquiries may be directed to the Office of Business Development, Economic Development Administration, U.S. Department of Commerce, Washington, D.C. 20230.

VII Investment Tax Credit

Under the provisions of the Tax Reform Act of 1976, the 10 percent investment tax credit provided for under the 1975 act for purchased equipment was continued. This allows a firm to take 10 percent of the cost of certain capital investments as a credit against its Federal tax liability. The investment tax credit is an instrument of industrial policy intended to encourage capital investment and expansion. While not specifically designed to aid firms installing pollution control equipment, investments in the purchase and installation of such equipment are among the investments eligible for the tax credit.

Capital investments eligible for the tax credit have the following limitations based on their expected useful life:

USEFUL LIFE	PERCENT OF COST OF PROPERTY QUALIFYING FOR CREDIT
Under 3 years	0
3 yrs. or more but less than 5 years	33 1/3
5 yrs. or more but less than 7 yrs.	66 2/3
7 yrs. or more	100

The amount of investment credit which may be claimed in a taxable year generally cannot exceed $25,000 plus 50 percent of any tax liability in excess of $25,000. The Tax Reform Act of 1976 also extended through December 31, 1980 the $100,000 limitation on used property that could be taken into account as qualified investment for purposes of the investment tax credit for a taxable year.

VIII Rapid Tax Amortization

From 1969 through December 31, 1975, when the provisions were terminated, an election for a five-year amortization was available to a taxpayer who installed a new identifiable, certified pollution control facility in connection with property that was in operation before January 1, 1969. These provisions were enacted by Congress to reduce the resistance of private industry to the installation of pollution control equipment required to meet new regulations. Although the provisions were intended, in part, as a substitute for the investment tax credit then being repealed, when the investment credit was reinstated by the Revenue Act of 1971, the taxpayer was prohibited from taking both the amortization deductions and the investment tax credit.

The Tax Reform Act of 1976, enacted October 4, 1976 reinstituted the rapid tax amortization provisions. The 1976 Act provides for the availability of a five-year amortization election for facilities that will prevent the creation or emission of pollutants when installed at the site of a plant or other property in existence before January 1, 1976, provided such installation does not lead to a significant increase in output or capacity, a significant extension of useful life, a significant reduction in operating costs or a significant alteration in the nature of a manufacturing or production process or facility (significance is defined for the purposes of this provision as a change of greater than 5 percent.) The Act also provides for the availability of one-half of the investment tax credit (5 percent) for such pollution control facilities.

Rapid amortization under the new law is attractive for pollution control equipment with depreciable lives longer than 11 to 12 years. For equipment with shorter lives, standard amortization yields greater tax savings.

The magnitude of the potential tax benefits provided by the new tax law over standard amortization practice varies as a function of discount rate (rate used to determine the value today of a future stream of cash flows.) and depreciable equipment life. Assuming depreciable equipment life of 14 years the rapid amortization provision yields an additional tax advantage of about 5 percent in real terms over standard depreciation methods (a present value of tax benefits of $431 per $1,000 investment as opposed to $409 per $1,000 investment).

A more comprehensive study of tax implications of rapid amortization is available as an appendix to this study. For questions regarding this study write to the Office of Planning & Evaluation, Economic Analysis Division, U.S. Environmental Protection Agency, 401 M St. S.W. (PM-220), Washington, D.C. 20460, telephone (202) 755-0733.

IX Sales/Use Tax Exemptions

Sales or use taxes are charged to a corporation for the purchase or use of manufacturing equipment and machinery. A state will often levy a "use" tax on merchandise purchased outside of the state's boundaries.

When granting such exemptions, states must be certain that the firm involved is purchasing or installing equipment actually designed for pollution control. Equipment or machinery which normally is considered part of the industrial production process is not regarded as having been specifically designed for pollution control. Thus, such equipment or machinery is assessed the normal sales or use taxes.

X Real Property Tax and Corporate Tax Law Exemptions

Practically all States provide for corporate income tax deductions and real property tax exemptions for industrial wastewater treatment facilities certified for exemption by the designated state agency.

State pollution control tax exemptions provide that the value of personal property used in a corporation's pollution abatement program can be deducted from the total value of that corporation's assessable personal property. For example, a corporation which installs pollution control equipment at a plant would be able to subtract the value of that equipment from the total value of the corporation's assessable personal property. However, any additional land or buildings necessary to locate or house the pollution control equipment would be classified as real property, and thus would be tax exempt only if the state had pollution control tax exemptions for real property.

XI FINANCIAL PROGRAMS AVAILABLE FOR FARMERS

A The Farmers Home Administration (FmHA). The Consolidated Farm and Rural Development Act authorized FmHA to make operating and farm ownership loans to qualified ranchers and farmers who are or will become operators of not larger than family farms. It must be clearly established that applicants are unable to obtain sufficient credit elsewhere to finance their actual needs.

In designated areas FmHA is authorized to make emergency loans to qualifying individuals, partnerships or corporations.

Loans made for livestock production facilities may include funds for necessary pollution abatement and control facilities and equipment. The regulations for such loans require that feedlots or holding facilities which are likely to have a significant adverse effect on the environment and for which such loans are being developed will have an environmental impact assessment. The livestock production enterprise must be in compliance with applicable health and pollution standards administered by appropriate Federal, State and local agencies.

FmHA is authorized to make farm operating loans not to exceed $50,000 at 4% interest with up to 7 years to repay, and farm ownership loans up to $100,000 at 5% interest with up to 40 years to repay, with participating credit from other sources of not more than an additional $125,000.

FmHA Business and Industrial loans may be made in any area outside the boundary of a city of 50,000 or more and its immediately adjacent urbanized areas with population density of more than 100 persons per square mile. Priority will be given to applications for projects in open country, rural communities, and towns of 25,000 and smaller.

FmHA assistance ordinarily is provided as a loan guarantee whereby the agency contracts to reimburse the lender for not more than 90 percent of principal and interest. Applicants apply for the guarantee through their private lenders.

Any legal entity, including individuals, public and private organizations, and federally recognized Indian tribal groups are eligible.

The basic purposes include developing or financing business or industry, increasing employment, and controlling or abating pollution.

Repayment of the loan varies but final maturity will not exceed 30 years for land, buildings and permanent fixtures, 15 years for machinery, or the life of the equipment, whichever is shorter.

For guaranteed loans, the interest rate may be fixed or variable and will be determined by the lender and the borrower, consistent with the market rate.

B. Agricultural Conservation Program A program through which the Federal government shares with farmers the cost of carrying out soil, water, woodland and wildlife conservation measures on privately owned farmland. Cost-share assistance ranges from 50 to 75 percent of the cost of carrying out approved practices with the overall average costs generally shared equally by landholders and Government. Basic measures applied under the program include providing protective soil cover, conserving and disposing of water, providing benefits to wildlife, preventing or abating agriculture-related pollution, and generally improving the quality of the environment. The practices must be carried out based on prescribed engineering plans developed by the Soil Conservation Service. There is a national limitation of $2,500 on the amount of assistance to any one person in a year. Under the long-term agreement plan, a producer may establish certain measures one year and other measures in a future year.

C. Soil Conservation Service (SCS) - Cost sharing assistance through long-term contracts is provided to individual land owners or groups of land owners for many practices under the provisions of the Great Plains Conservation Program. These practices include lagoons, holding ponds and waste storage facilities as part of overall systems for recycling animal wastes to the land in portions of the ten Great Plains States.

To be eligible for assistance under the GPCP the farmer must have control of the land for the period of the GPCP contract. The pollution abatement practice may be included in the GPCP contract at the producer's option, when the farm plan provides that certain measures are needed on the farm to bring about wind and water erosion control.

The SCS has national responsibility for soil surveys. Use of soil survey and interpretations thereof are basic to carrying out programs for using the land to recycle waste materials. SCS personnel provide information on the suitability of various soils for safely assimilating and utilizing a wide variety of wastes as a resource in the production of food and fiber. Technical assistance is provided to land owners and operators, local communities, and many other agencies. Soil scientists, plant scientists, engineers and other specialists provide assistance in determining soil suitability, selection and management of plant species, and in planning management systems for recycling animal wastes through the soil and its plant cover.

Inquiries should be directed to the Production Loan Division, U.S. Dept. of Agriculture, Farmers Home Administration, Washington, D.C. 20250 or the county Farmers Home Administration Office serving the area where the property is located.

APPENDIX

ANALYSIS OF THE TAX IMPLICATIONS OF RAPID AMORTIZATION

Environmental Protection Agency
Office of Planning and Evaluation
Economic Analysis Division
May 1977

ANALYSIS OF THE TAX IMPLICATIONS OF RAPID AMORTIZATION

TAX REFORM ACT OF 1976

Section 2112 of the Tax Reform Act of 1976 (P.L. 94-455), signed into law October 4, introduces some significant changes affecting tax treatment of certain pollution control facilities. Prior to 1975, a firm investing in pollution control equipment for an existing plant could elect one of two options: rapid amortization or normal depreciation practice, called here standard amortization. If rapid amortization was chosen then the first 15 years of depreciable life could be amortized over a 5 year period. However, by so doing the firm had to forego the investment tax credit.

The provisions of 26 U.S.C. 169 which authorized the rapid amortization of pollution control equipment expired as to facilities installed after December 31, 1975. But the new legislation restored rapid amortization as a permanent provision for facilities installed after December 31, 1975 in plants in operation before January 1, 1976. Further, for those facilities installed after December 31, 1976, the new law permits the concurrent use of rapid amortization and the investment tax credit; however, if the tax credit is used in conjunction with rapid amortization only one-half of the currently allowable investment credit may be claimed.

In restoring rapid amortization, Congress left the rules governing eligibility for certification essentially unchanged, since process changes to accommodate cleaner production methods remain ineligible.1/ However, the Code has been modified to allow the certification of processes that prevent the creation of contaminants (e.g., fuel desulfurization equipment if the fuel is burned on-site) when installed in an existing plant.

These revisions were precipitated by the fact that, after the reinstatement of the investment tax credit in 1971, 26 USC 169 was used only infrequently because the standard investment tax credit plus standard amortization practice provided greater tax benefits. The concurrent use of the investment tax credit and rapid amortization now authorized appears to make the rapid amortization option more attractive to the investor in pollution control equipment.

1/Section 2112 excludes from eligibility equipment which increases output or capacity by more than 5 percent, extends the useful life, or reduces the total operating cost of the plant. Further, rapid amortization can only be applied to facilities with a depreciable life greater than 5 years. For a more precise definition of facilities which may be certified for rapid amortization the reader should refer to 40 CFR, Part 20, Certification of Facilities.

ANALYSIS OF THE TAX BENEFITS UNDER THE NEW LAW

The present value of the flow of tax benefits resulting from a capital investment is determined by a basic relationship between four principal variables: (1) the discount rate, 2/ (2) the asset life, (3) the method of depreciation, and (4) the investment tax credit. The first two variables have the largest effect on the value of the flow of tax benefits. And, within certain distinct limits, it can be said that higher discount rates tend to make rapid amortization more attractive to the investor, as do relatively long asset lives. By contrast, the choice of depreciation method has relatively little effect on the value of the tax benefits. In fact, the sum-of-years digits method is always preferred over other depreciation formulas if asset life is more than 5 to 6 years. 3/ Finally, the size of the investment tax credit has a measurable impact on the desirability of rapid amortization. If the firm is eligible for a relatively large credit in relation to the investment, the attractiveness of rapid amortization will be diminished.

Past changes in the investment tax credit have also significantly altered the benefits provided by rapid amortization. When 26 USC 169 was originally enacted in 1969, the investment tax credit was repealed. Later, in 1971, Congress reinstated the 7 percent credit and many firms found that rapid amortization no longer provided tax advantages, particularly those installing equipment with short to moderately long asset lives. The subsequent increase in the investment tax credit to 10 percent under the Tax Reduction Act of 1975 eliminated the benefits of rapid amortization for almost all investors.

The following analysis of the tax implications of the new law was performed based upon some key simplifying assumptions. Hence, the conclusions, while providing a satisfactory order of magnitude assessment for the general case, may be imprecise when applied to specific situations. First, a corporate tax rate of 48 percent and a state income tax rate of 4.8 percent were used, the latter representing a typical rate for most states.

2/ The discount rate is rate used to determine the value today of a future stream of cash flows.

3/ The magnitude of tax benefit provided by rapid amortization over standard amortization practice is influenced by the method of calculating depreciation selected by the investor, an effect separate from the one attributable to the decision to use rapid amortization. This analysis was performed using the two accelerated depreciation methods utilized by most investors: sum-of-years digits and double declining balance. If standard amortization practice is used, it was found that for equipment with depreciable lives more than 5 to 6 years, sum-of-years digits provided the greatest tax advantages. And, if rapid amortization were selected double declining balance was never uniquely preferable to sum-of-years digits (for that portion of depreciable life which exceeds 15 years).

In practice, the marginal rate may vary from the assumed total of 52.8 percent. 4/ However, this will not effect the decision to select rapid amortization; it will only change the present value of tax benefits. Second, the actual size of the investment tax credit can vary significantly. This analysis is based on a graduated credit, with the full credit applicable only when the useful equipment life is greater than or equal to 7 years. If the credit realized by the firm is less than assumed here then, other things being equal, rapid amortization will be attractive for equipment with slightly shorter life than this analysis would indicate.

Benefits Provided by Rapid Amortization

In the range of discount rates which are applicable to most firms (greater than 8 percent) we find that rapid amortization under the new law is attractive for pollution control equipment with depreciable lives longer than 11 to 12 years. For equipment with shorter lives, standard amortization yields greater tax savings. Exhibit I depicts this relationship.

It is interesting to note that under the new law the point of indifference between rapid amortization and standard amortization practice does not change significantly for discount rates roughly above 14 percent. This is due to the fact that at high discount rates the immediate cash flow emanating from the investment tax credit is so highly valued that future benefits resulting from rapid amortization are outweighed.

The magnitude of the potential tax benefits provided by the new tax law over standard amortization practice varies as a function of discount rate and depreciable equipment life. For illustrative purposes, Exhibit II plots the tax benefits against depreciable life based on a discount rate of 12 percent. Assuming a depreciable equipment life of 14 years the rapid amortization provision yields an additional tax advantage of about 5 percent in real terms over standard depreciation methods (a present value of tax benefits of $431 per $1,000 investment as opposed to $409 per $1,000 investment).

Benefits Provided by the New Law Over the Previous Law

The new tax law also provides significant tax benefits beyond those allowed under the old provisions of 26 USC 169. These increased advantages result from the fact that the new tax law permits investors to take one-half of the investment tax credit in addition to rapid amortization, whereas prior to the new law, firms were not allowed

4/The investment decision should be analyzed as a commitment of funds at the margin. Hence, the appropriate corporate tax rate for this analysis is the marginal rate and not the effective rate. Although effective corporate tax rates are substantially lower than 52.8 percent, we believe that this figure is representative of the marginal rate.

to take advantage of both. As Exhibit I indicates, the point where rapid amortization becomes attractive now has shifted to the left (forward). At a discount rate of 10 percent, rapid amortization under the new law provides tax advantages for equipment with a depreciable life of 12 years. By contrast, during 1975, the former 26 USC 169 would only have been beneficial for pollution control equipment with lives longer than 18 years.

An additional insight can be gained by adding broader perspective to the analysis. When 26 USC 169 was originally enacted in 1969, it provided attractive benefits to almost all investors. However, the reinstatement of a 7 percent investment tax credit in 1971 had the effect of making standard amortization practice attractive to firms installing equipment of short to moderate life - that is less than 14 to 15 years. Increasing the investment tax credit to 10 percent shifted the point of indifference by 3 to 4 years, further reducing taxpayer interest in rapid amortization. Hence, a key benefit of the Tax Reform Act of 1976 is to make rapid amortization desirable for shorter-lived equipment once again, while increasing the present value of tax benefits for users of rapid amortization.

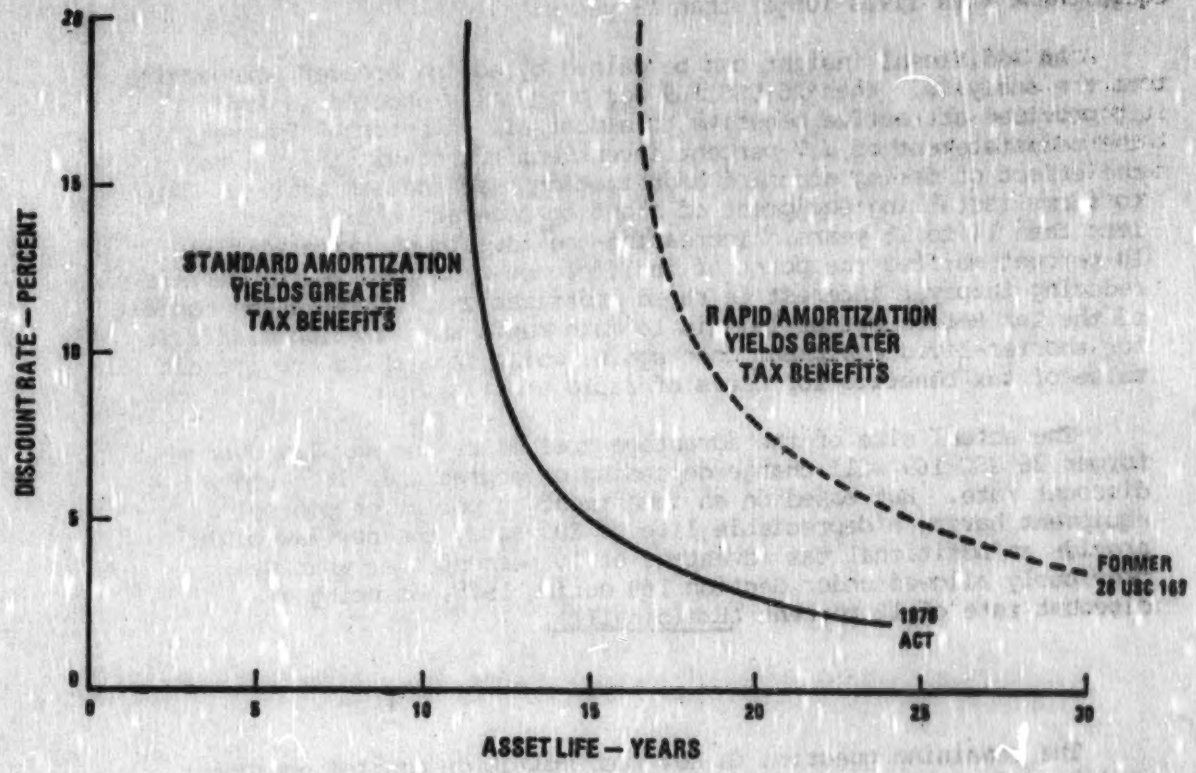
The actual size of the advantage created by the new law over former 26 USC 169 will change depending on depreciable life and discount rate. But based on an investment in pollution control equipment having a depreciable life of 20 years, the new law could provide an additional tax advantage of 10 percent over what was previously allowed under Section 169 during 1975, assuming a discount rate of 12 percent (Exhibit III).

* * *

The remaining question is how much pollution control equipment will have depreciable lives greater than 11 to 12 years. Unfortunately, there is no straightforward answer. Since much pollution control equipment will be depreciated under the same guidelines as the productive equipment to which it is attached, the same kind of pollution control facility could be depreciated at different rates depending on the industry.

EXHIBIT I

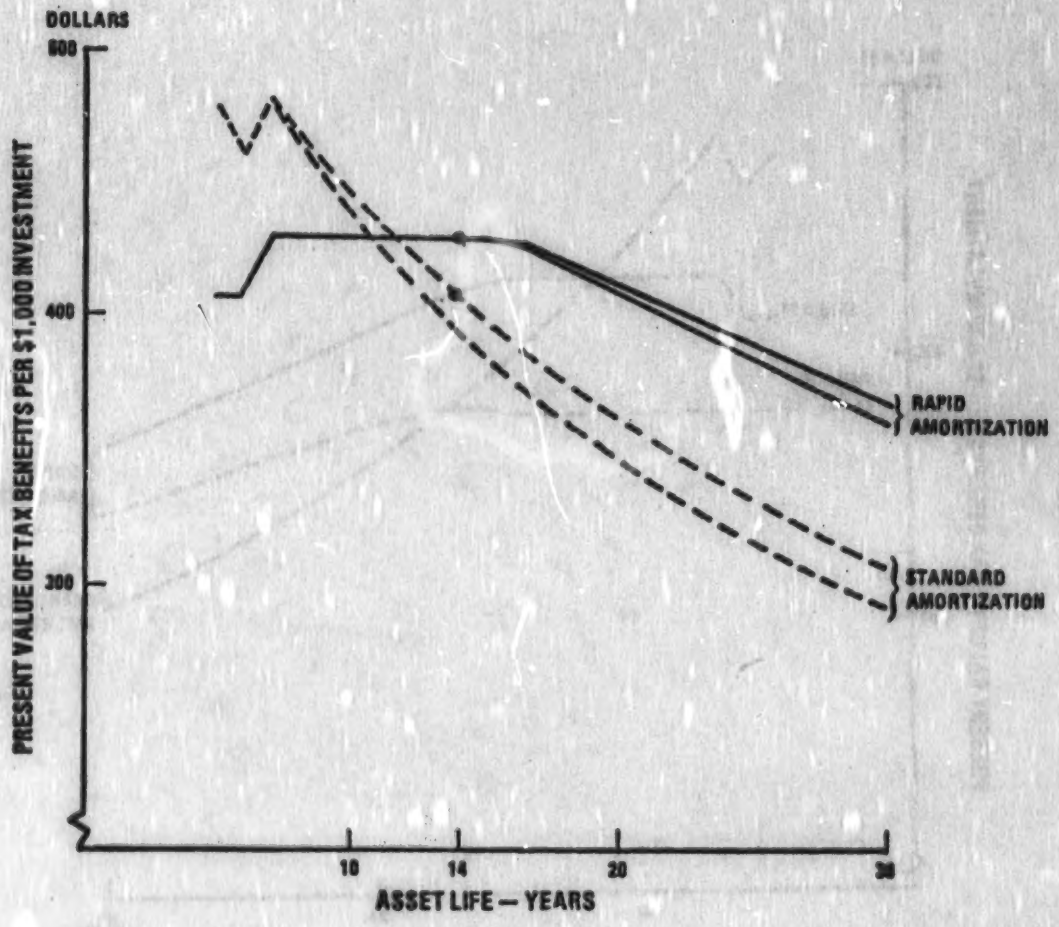
INDIFFERENCE CURVE FOR AMORTIZATION OPTIONS UNDER THE TAX REFORM ACT OF 1976 AND FORMER 26 USC 169: STANDARD AMORTIZATION VS. RAPID AMORTIZATION



NOTE:
BOTH CURVES ARE BASED ON A 10% INVESTMENT TAX CREDIT.

EXHIBIT II

TAX REFORM ACT OF 1976
PRESENT VALUE OF TAX BENEFITS

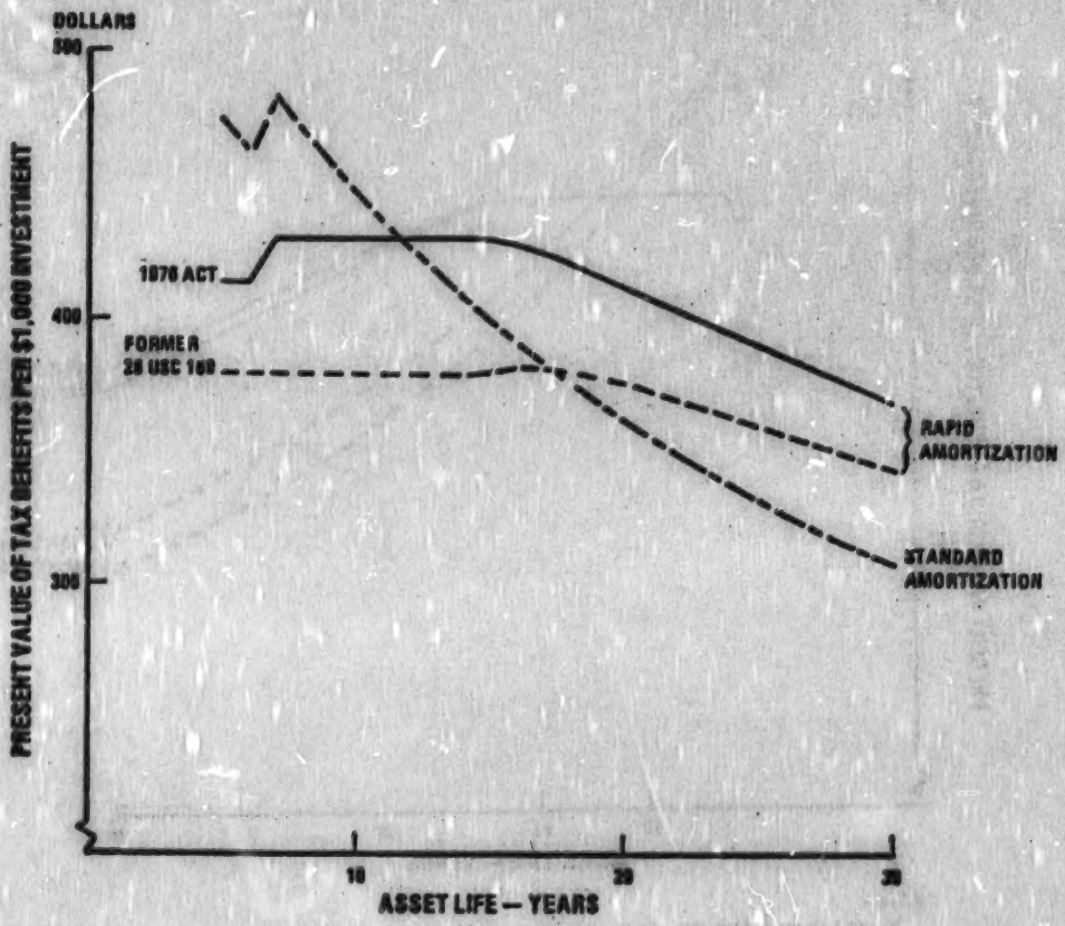


NOTES:

1. FOR EACH SET OF CURVES (RAPID AND STANDARD AMORTIZATION), THE HIGHER VALUES RESULT FROM THE USE OF SUM-OF-YEARS DIGITS AND LOWER VALUES FROM THE DOUBLE DECLINING BALANCE METHOD.
2. PRESENT VALUE OF TAX BENEFITS WERE CALCULATED USING A DISCOUNT RATE OF 12%.
3. THE INITIAL DIP IN THE CURVES IS CAUSED BY THE FACT THAT EQUIPMENT WITH AN ASSET LIFE OF LESS THAN 7 YEARS IS NOT ELIGIBLE FOR THE FULL INVESTMENT TAX CREDIT.

EXHIBIT III

COMPARISON OF BENEFITS
TAX REFORM ACT OF 1976 AND FORMER 26 USC 169



NOTE:
PRESENT VALUES WERE CALCULATED USING SUM-OF-YEARS DEPRECIATION METHOD, A DISCOUNT RATE OF 12%, AND A 10% INVESTMENT TAX CREDIT.